

TerranearPMC Safety Share

Week of August 5, 2013 – The Heartland Virus

Not that long ago, in 2009, two Missouri men were admitted to a hospital with high fevers, diarrhea, fatigue and a severe drop in the number of their white blood cells (immune cells that fight infection). Because the disease's symptoms looked similar to bacterial infection, doctors gave the men antibiotics, but they didn't improve. After further studies, it was concluded that the two men were infected with a new type of virus. Once this was determined to be the two men's ailment, they responded to proper treatment and recovered after 10 to 12 days in the hospital.

Researchers dubbed the new virus, Heartland virus, as it was first located in the country's heartland. It belongs to a virus group called phleboviruses (originating from Latin, meaning vein poison), which are carried by flies, mosquitoes or ticks, and can cause disease in humans. "Phlebovirus" is the name for a family of related viruses and are found all over the world that, according to the Centers for Disease Control and Prevention (CDC), while the genetic material of Heartland virus appears similar to that of other phleboviruses, the particular proteins it produces are different enough to call it a new species.

The findings, published in the American Journal of Tropical Medicine and Hygiene (July 22, 2009), confirm what scientists had suspected. It resembled another tick-borne pathogen called SFTS (severe fever with thrombocytopenia syndrome ó low platelet count) virus, which had been identified in China and was fatal in 12 percent of cases.

Though researchers suspected that ticks spread the virus, additional ticks in Missouri were collected for continued studies. More than 7,000 tick nymphs were brought back into a laboratory setting for analysis. They found that about 1 in 500 of members of species *Amblyomma americanum*, also known as lone star ticks, carried the Heartland virus. This tick is widespread throughout the Southern and the eastern portions of the United States.

According to an article in the New England Journal of Medicine, because the Heartland virus causes such general symptoms, it could be a more common cause of human illness than is currently recognized. Because this virus is still so new to medical professionals, more studies are needed to identify the natural hosts of the virus while understanding how many people are infected with it and find risk factors for infection.

So, with the discovery of the Heartland virus, we now have one more disease to add to the list of tick-borne illnesses. Ticks also transmit Lyme disease, a malarialike disease called Babesiosis that has been on the rise and a virus that seems to trigger meat allergies. CDC scientists want to get the message out, "ticks are dangerous."

To avoid getting bitten, people should wear long sleeves and long pants, wear tick repellent, perform a tick check when they come home from the woods or at the end of the work shift when working in pen fields, and take showers after spending time outdoors. Use lotions, sprays, and

other products that contain an effective repellent, such as DEET, picaridin, or oil of lemon eucalyptus. The CDC recommends using repellents that contain 20 percent or more DEET, as well as avoiding wooded areas or areas with high grass.

If you start to develop a fever or a rash after spending some time in the outdoors, and suspect a tick bite, contact your doctor. Currently, there is no vaccine or drug to prevent or treat the disease. However, there are certain precautions people can take to reduce their risk from contracting the Homeland virus.

Things you can do around your home to reduce your risk (as well as family members' risk) to tick bites is to regularly remove leaf litter and clear tall grasses and brush around homes. Placing wood chips or gravel between lawns and wooded areas is another way to help keep ticks away from recreational areas.

Some Information about DEET

DEET or *N,N*-Diethyl-*meta*-toluamide (for all you chemists ó but it seems easier to just say öDEETö), is a slightly yellow oil. It is the most common active ingredient in insect repellents. It is intended to be applied to clothing, and provides protection against mosquito bites, tick bites, flea bites, chiggers, and many other biting insects. Recent evidence shows that DEET serves as a true repellent in that mosquitoes, as well as other insects, intensely dislike the smell of the chemical repellent, regardless of female/male gender. A type of olfactory receptor neuron in special antennal sensilla of mosquitoes that is activated by DEET, as well as other known insect repellents such as eucalyptol, linalool, and thujone, has been identified.

DEET is often sold and used in spray or lotion in concentrations up to 100%. *Consumer Reports* found a direct correlation between DEET concentration and hours of protection against insect bites. 100% DEET was found to offer up to 12 hours of protection while several lower concentration DEET formulations (20%-34%) offered 366 hours of protection. Other research has corroborated the effectiveness of DEET. The Center for Disease Control recommends 30-50% DEET to prevent the spread of pathogens carried by insects.

As a precaution, manufacturers advise that DEET products should not be used under clothing or on damaged skin, and that preparations be washed off after they are no longer needed or between applications. DEET can act as an irritant; in rare cases, it may cause severe epidermal reactions. Products containing between 10% to 30% DEET have been found by the American Academy of Pediatrics to be safe to use on children, as well as adults, but recommends that DEET not be used on infants less than two months old.

The power of imagination makes us infinite.

John Muir